Weather Information Communications

Scope

- Future needs of weather information communications involving aircraft.

Weather Information Communications

Datalink Capacity

- What will the requirements (capacity, spectrum, quality of service, message delivery mode, etc.) of informational/advisory datalinks be in the future?
- Timeliness would be a factor if the weather data is to be used tactically. (Observation to presentation)
- Weather information needs to be considered in relation to all of the information going to the cockpit.
- Weather information will have to share the communications link with other data such as other FIS data.

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Datalink Capacity

- TFRs need to be updated a couple of times an hour.
- Need a better understanding as to what weather products (and the composition of the products) that should be sent to the aircraft.
- Different pilots have different needs. Provide the pilot the capability to tailor the products to his/her needs.
- GA pilots have a need for more weather products than commercial pilots because commercial pilots have support from dispatchers. Consequently, the smaller aircraft have more of a bandwidth requirement to support weather products than do the airliners.

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Datalink Capacity

- Focus on transport aircraft communications equipage needs to consider the 7 – 12 year implementation cycle.
- Capability in the air or on the ground needs to be able to provide context sensitive weather products to the aircraft. TCAS is an example of a context sensitive system.
- Pilot should have the capability to request information that is appropriate to him/her.
- Need the capability to send all of the weather data to the aircraft.

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Datalink Capacity

- A broadcast communications approach is not consistent with just providing context sensitive data.
- There is a core set of weather data that can be sent via a broadcast means.
- A potential ground system could monitor the weather in the vicinity of an aircraft and send information about critical weather in its projected path to an aircraft using its 24-bit address to uniquely identify the aircraft.
- It would be beneficial for an aircraft that experiences a micro-burst to broadcast it to other aircraft in the area.

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Datalink Capacity

- If context sensitive weather is processed on the ground, the information would use an addressed message approach. The existing and planned links don't have the capacity to handle the addressed messages.

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Information Processing

- What will the future weather information processing and integration requirements be and how will it drive datalink requirements?
  - Automated Decision Aiding (data to the aircraft) vs. Pilot Assimilation & Decision Making (product set to the aircraft)
- Should the product be created on the ground or on the aircraft?
- Providing context sensitive information requires that pilot/flight data be provided before the flight begins; e.g., IFR vs VFR flight, training level of the pilot.

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Information Processing

- How do NOTAMs get to the aircraft and displayed to the pilot in a way that is easily understood?
- Tradeoff has to be made on whether extensive processing is performed in the cockpit or on the ground.
- Can air-air communications relieve some of the processing that occurs on the ground? Does the delay involved in sending the data to the ground make it less useful to aircraft that are close to the weather phenomena?

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Information Processing

- Price point issue has some influence on what goes on to an aircraft.
- Market place situation today: The installed display generally limits the vendor applications that can be used on that display. They are restricted to those provided by the display vendor and its partners. The business situation has resulted in a limitation on interoperability.

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Decision Making

- Will autonomous decisions be allowed in the future NAS or will collaborative decision making remain the norm?
  - What effect will this have on datalink requirements?
  - What about “free flight”?
- Pilots can fly in Class G airspace without interacting with the ATS.
- Current datalink weather program is encouraging more collaboration.
- GA environment has moved away from collaboration due to cost constraints (e.g., Flight Service Station limitations)

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Decision Making

- Some FIS users believe they have better weather information than the air traffic controllers. (The controller is not a weather briefer.)
- There needs to be better coordination between the weather safety issues, capacity issues, and airline efficiency issues.
- Future systems should provide the pilot with options rather than just data or information. Will reduce pilot workload.

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Datalink Cost

- How will datalink costs be reduced and what role will public networks play in aviation with respect to private (aviation only) networks in the future?
- What is the future role of SATCOM over land masses?
- Cost can be reduced by broadening the user base.
  - Might increase the link capacity requirements.
  - Use the weather in your car, boat and on the aircraft
- Cost can be reduced by implementing a multi-function datalink.
  - May require a greater capacity.
  - Reduce the quantity of radios needed.

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Datalink Cost

- Multi-use datalink has to support QoS for each application.
- Rudimentary weather processing on board the aircraft could mean less frequent updates resulting in less cost. However, manufacturers are reluctant to take on the liability associated with doing the on board processing.
- The UAT is a Government “pipe”. There has been some discussion as to whether vendors would have access to the “pipe”.

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Datalink Cost

- An individual may need a second weather source and associated data radio since there will be a limited set of weather products on UAT. The initial set will be three products.

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Attendees:

Mike Jarrell – GRC

Tom Tanger – Ohio Aerospace Institute

James Tauss – Aviation Management Associates

Rick Slywczau – GRC

Jim Cistone – Lockheed Martin TSS

Jim Griner – GRC

Heinz Bartacek – Austro Control

Sunital Munsal – Johns Hopkins University/APL

Erik Roberts – GRC/Analex Corporation

Brian Kachmar – Analex Corporation

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Attendees:

Kevin B. Mattison – HQ FAA/AVR/AIR-130

Jocelyn Descaillot – SITA

Gerry Preziotti – Johns Hopkins University/APL

Jim Joyce – Honeywell

Larry Bachman - Johns Hopkins University/APL

Paul Stough – NASA/LaRC

Khaled Arisha – Honeywell

Eric Weill – Trios Associates

Wayne Buhrman - Johns Hopkins University/APL

Tom Mulkerin – Mulkerin Associates Inc.

Weather Information Communications

- Workshop Session Timing
  - As it is this time
  - For an hour or so after the WINCOMM session